

Virginia Tech Advanced Separation Facility

Virginia Tech has extensive facilities for both fundamental and applied research and development projects in materials recycling, recovery and reuse. Two examples of these facilities include Virginia Tech's Macromolecular Materials Discovery Center (MMDC) and the Center for Advanced Separation Technologies (CAST). As Virginia's leading research institution, facilities such as these are used to fulfill Virginia Tech's land-grant mission of transforming knowledge to practice through technological leadership and by fueling economic growth and job creation within the Commonwealth.



Macromolecular Materials Discovery Center (MMDC)

MMDC is a state-of-the-art materials characterization laboratory that provides partners access to specialized instrumentation for collecting characterization data on novel materials. Equipment is available to conduct mechanical (dynamic mechanical analysis), thermal (thermogravimetric analysis and differential scanning calorimetry), molecular weight determination (ultra-high performance, aqueous, and high-temperature size exclusion chromatography) thermal expansion, thermal conductivity, ionic conductivity, surface area and porosity, and 3D printing (extrusion and stereolithography), expanding the scope of research and the potential applications for their products. The MMDC model allows all affiliated researchers access under any financial condition.



Center for Advanced Separation Technologies (CAST)

CAST has a broad range of facilities and equipment available for process engineering R&D projects related to the production of primary (mined) and secondary (recycled) materials. CAST research is supported by a dedicated off-campus research facility consisting of six laboratories, a two-story 4,500 ft² pilot-plant testing facility, and a fabrication shop. The pilot-plant houses more than 30 different unit operations for solid-solid and solid-liquid separation including density separators, mechanical and column flotation cells, flowing film separators, magnetic and electrostatic separators, and enhanced gravity concentrators. Experienced operators for advanced analytical instrumentation are available to accommodate almost any type of research need in process engineering.

Virginia Tech Advanced Separation Facility's Equipment List

Macromolecular Materials Discovery Center (MMDC)

- Mechanical (dynamic mechanical analysis)
- Thermal (thermogravimetric analysis and differential scanning calorimetry)
- Molecular weight determination (ultra-high performance, aqueous, and high-temperature size exclusion chromatography)
- Thermal expansion
- Thermal conductivity
- Ionic conductivity
- Surface area and porosity
- 3D printing (extrusion and stereo-lithography),

Macromolecular Materials Discovery Center (MMDC)

- Density separators
- Mechanical and column flotation cells
- Flowing film separators
- Magnetic and electrostatic separators
- Enhanced gravity concentrators.